

U.S.S.N. 09/235,875

Filed: January 22, 1999

AMENDMENT AND RESPONSE TO OFFICE ACTION

In the Claims

1. (presently four times amended) A method for the biological production of polyhydroxyalkanoate containing 3-hydroxyhexanoate in *E. coli* expressing a one or more genes selected from the group consisting of a phbA thiolase gene encoding an enzyme that converts butyryl-CoA and acetyl CoA to beta-ketohexanoyl-CoA, a phbB reductase gene that encodes an enzyme that converts beta-ketohexanoyl-CoA to beta-hydroxyhexanoyl-CoA, and a phbC polymerase gene that encodes an enzyme that polymerizes 3-hydroxybutyryl CoA, the improvement comprising expressing in the *E. coli* a D-specific enoyl-CoA hydratase gene and β -hydroxyacyl-ACP-coenzyme A transferase gene, and providing feedstocks for the transgenic *E. coli*, wherein the enzymes are expressed in a sufficient amount to produce polyhydroxybutyrate-co-polyhydroxyhexanoate.

6. (previously two times amended) The method of claim 1 wherein the phbC polymerase gene encoding a PHA polymerase enzyme that incorporates C6 substrates is incorporated into the bacterial chromosome.

7. (previously two times amended) The method of claim 1 wherein the phbC polymerase gene is from a bacteria selected from the group consisting of *Aeromonas caviae*, *Comamonas testosteroni*, *Thiocapsia pfenigii*, *Chromatium vinosum*, *Bacillus cereus*, *Nocardia carolina*, *Nocardia salmonicolor*, *Rhodococcus ruber*, *Rhodococcus rhodocrous*, and *Rhodospirillum rubrum*.

10. (previously three times amended) The method of claim 1 wherein the genes encoding the D-specific enoyl-CoA hydratase and β -hydroxyacyl-ACP-coenzyme A transferase

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are isolated from a bacterium selected from the group consisting of *R. eutropha*, *Klebsiella aerogenes*, *P. putida*, and *Aeromonas caviae*.

14. (presently twice amended) The method of claim ~~11~~ 1 wherein the *E. coli* expresses a broad range reductase that is active on C₆ substrates.

15. (presently three times amended) The method of claim ~~11~~ 1 wherein the *E. coli* expresses a polymerase that accepts 3-hydroxyhexanoyl CoA and 3-hydroxybutyryl CoA.

16. (presently twice amended) The method of claim ~~11~~ 1 wherein the *E. coli* expresses a thiolase accepting acetoacetyl CoA.

17. (presently twice amended) The method of claim ~~11~~ 1 wherein the *E. coli* expresses an enzyme selected from the group consisting of thiolases specific for 3-ketohexanoyl CoA, reductase active on 3-ketohexanoyl CoA, and 3-hydroxyhexanoyl CoA.

18. (presently twice amended) The method of claim 8 1 wherein the *E. coli* expresses one or more fatty acid biosynthetic enzymes.

19. (previously once amended) The method of claim 18 wherein the fatty acid biosynthetic enzymes convert acyl ACP to acyl CoA.

20. (original) The method of claim 19 where the enzymes are selected from the group consisting of ACP-CoA transacylase, acyl ACP thioesterase, and acyl CoA synthase.

21. (original) The method of claim 20 wherein the enzymes are acyl ACP thioesterase and acyl CoA synthase.